Risk assessment: use of glassware

Hazards

- Cuts from damaged or broken glass.
- Cuts from flying glass due to implosion following evacuation or mechanical shock or stress.
- Cuts from forcing plastic tubing, teats or rubber bungs onto glass tubing, pipettes or condensers that break.
- Cuts from broken glass and sharp items e.g. Pasteur pipettes disposed in ordinary wastebins.
- Burns from heated glass.
- Poisoning following cuts by contaminated glassware.

Risk

For an untrained person the probability of being injured (cut) by broken or breaking glass is rated as likely with any injury being moderate to severe.

Who is likely to be injured? From mishandling of glassware, the most likely person to be injured is the user although, in the case of imploding glass, anyone in the vicinity is likely to be hurt.

Control Measures

- Physical:
  - Glass vessels under vacuum should normally be enclosed in plastic or wire mesh to prevent fragments being scattered after implosion.
  - Broken glass must be disposed of into specially designated bins and not into the normal waste bins.
- Training: Training in the safe use of normal laboratory glassware is part of the Undergraduate course but extra training by Research Advisers/Supervisors may be required for the use of glassware under vacuum.
- P.P.E (Personal Protective Equipment): Depending on the procedure being performed Safety Glasses or Face Shield should be worn. In some circumstances, e.g. when pressure is applied in fitting tubing to glass, leather gloves covering the wrists or towel or tissue padding may be required

Operating Precautions

- Before use, all glassware should be checked to ensure that it is free from cracks, flaws or scratches that may cause it to fail in use.
- Glass should be transported carefully and never in pockets.
- Glass must never be stored on the floor.
- When fitting tubing to glassware, glass may be lubricated with water or glycerol and the plastic tubing softened by brief immersion in hot water. Excessive force must not be used or force in a direction which will make the glass snap. Thought should be given as to where the sharp edge of the glass might go if it does break and the grip
arranged accordingly. The glass may be wrapped in a towel or thick layers of paper tissue. When tubing is being removed, a sharp knife can be used to cut off tubing that does not yield to gentle pressure.

- **Hot glass** (which looks the same as cool glass) should be treated with care and placed where no one can accidentally come into contact with it before it has cooled.
- **Joints and stoppers.** Ground glass connections should be lubricated before assembling and disassembled immediately after use. Flasks or containers must not be stoppered when hot. If a stopper seizes, it is **extremely dangerous to reheat** the container to remove it.
- **Damaged glassware** should be repaired or disposed of in the "Broken Glass" bin and not the ordinary waste-bins. A brush and dustpan should be used to clear up broken glass. Special care is needed when clearing broken glass from a sink where water can make sharp edges invisible: tongs can be used to pick out pieces.
- **Glass "sharps"** must be disposed of in the proper containers and not in the ordinary waste-bins.

**Vacuum use**

- Glassware subjected to vacuum should be carefully inspected for flaws before use.
- For glassware under vacuum, volumes of 1 litre or larger should be enclosed in tape or plastic mesh to restrain fragments in the event of implosion. This applies to equipment such as vacuum storage bulbs, rotary evaporators, vacuum desiccators etc. See the Risk Assessment "Use of Reduced Pressure or Vacuum".

**Washing**

- Detergents are the normal means of cleaning glassware. More drastic should be used only when cleaning with detergents or solvents is inadequate. Beware of fire risk if using solvents to clean or dry.

**Training Requirements**

The safe use of glassware is part of normal Undergraduate training

**Remaining Risk**

Cuts from broken glass or the misuse of glass remain amongst the commonest form of injury in the School of Chemistry. Great care is always required.

**Emergency Procedures**

- Cuts and burns should be treated immediately. No attempt should be made to remove broken glass from wounds.
- Apart from very minor injuries, a First Aider should be called.
- In the event of serious injury the posting "NOTFALL/UNTFALL" is to be followed.